National Science Museum

Bull. Natn. Sci. Mus., Tokyo, Ser. A, 7 (2), June 22, 1981

Two New Anophthalmic *Trechiama* (Coleoptera, Trechinae) Found in Mine Adits of Central Japan[1)]

By

Shun-Ichi UÉNO

Department of Zoology, National Science Museum, Tokyo

In the present paper, I am going to describe two new anophthalmic species of trechine beetles recently discovered in abandoned mine adits lying at the northern part of the Kinki District, Central Japan. Both the species belong to the *kosugei* complex of the group of *Trechiama oni*, and should have been included in the map showing the distribution of *Trechiama* in the Kinki District given on page 267 of my previous paper (UÉNO, 1980), if they had been known before its publication. And if this had been realized, the peripheries of the distributional ranges of the group of *T. ohshimai* and that of *T. oni* could have been demonstrated more precisely. The occurrence of one of the present new species in a mine adit at the northern tip of Osaka Prefecture is of particular importance from the zoogeographic view-point, since this mine is located on the line connecting the known ranges of the two different species belonging to the group of *T. ohshimai*.

The abbreviations used herein are the same as those explained elsewhere (*e. g.*, UÉNO, 1980, p. 196).

Before going further, I wish to express my deep indebtedness to Messrs. Yoshiaki NISHIKAWA and Akira NOTO for their continuous support of my study.

Trechiama (s. str.) ***silicicola*** S. UÉNO, sp. nov.

[Japanese name: Ichijima-mekura-chibigomimushi]

(Figs. 1–4)

Length: 4.60–5.45 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *T. kosugei* (UÉNO, 1955, p. 33, fig. 3, 1959, pp. 30, 31; JEANNEL, 1962, pp. 196, 197) from Magura, but externally distinguished at first sight from the endogean species by the absence of postangular seta on pronotum and more regularly oval elytra with more effaced shoulders and more oblique prehumeral borders. Very similar to *T. kosugei* in the general shape of male genitalia, but the left proximal teeth-patch is much larger, about double the length of that of the latter and bent at about middle, and a copulatory piece sets to take shape though still imperfect.

1) This study is supported by the Grant-in-aid for Scientific Research No. 434039 from the Ministry of Education, Japan.

NII-Electronic Library Service

National Science Museum

Colour as in *T. kosugei*, reddish brown, translucent and shiny, with faint iridescence on elytra; palpi, apical half to two-thirds of antennae, ventral surface of hind body, and legs yellowish brown.

Head as in *T. kosugei* though somewhat shorter; genae only slightly convex and gradually narrowed towards neck constriction, which is shallow and not sharply defined;

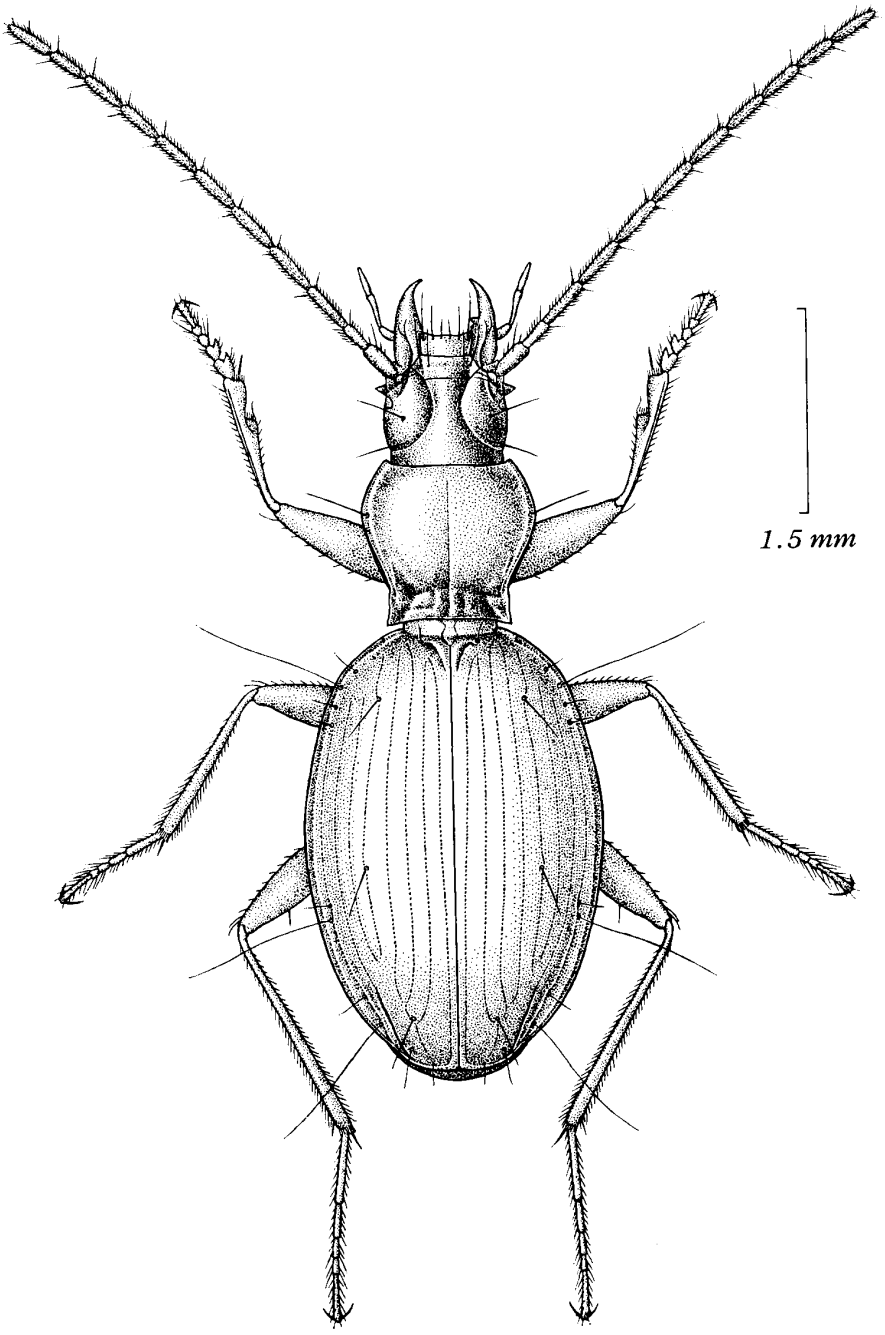


Fig. 1. *Trechiama* (s. str.) *silicicola* S. UÉNO, sp. nov., ♂, from Otogawachi Mine in Ichijima-chô.

NII-Electronic Library Service

National Science Museum

antennae somewhat stouter than in *T. kosugei*, usually reaching apical two-fifths of elytra. Pronotum as in *T. kosugei* except that the postangular seta is wanting, that the disc is obviously less convex, and that the front angles are a little less obtuse; PW/HW 1.37–1.47 (M 1.42), PW/PL 1.01–1.14 (M 1.08), PW/PA 1.39–1.46 (M 1.41), PW/PB 1.33–1.44 (M 1.39), PB/PA 0.99–1.06 (M 1.02). Elytra more regularly oval and less convex than in *T. kosugei*; EW/PW 1.68–1.76 (M 1.72), EL/EW 1.53–1.60 (M 1.56); shoulders effaced, with prehumeral borders very oblique and almost straight; sides more strongly and more regularly arcuate than in *T. kosugei*, more widely reflexed especially before middle; striation as in *T. kosugei*, apical striole usually joining stria 7 though sometimes joining stria 5; two setiferous dorsal pores present on stria 5 at 1/7–1/6 and 1/2–4/7 from base respectively; preapical pore present, lying at the apical anastomosis of striae 2 and 3, and more distant from apex than from suture. Legs as in *T. kosugei*.

Male genital organ similar to that of *T. kosugei*, equally small and rather lightly sclerotized. Aedeagus only one-fourth as long as elytra, very short, gently compressed, and dilated towards large asymmetrical apical orifice, with long apical lobe whose tip is conspicuously tuberculate; basal part small, only slightly curved ventrad, with fairly large basal orifice, whose sides are widely emarginate; sagittal aileron distinct though hyaline; viewed laterally, apical lobe narrow and straight, with the terminal tubercle curved ventrad; viewed dorsally, apical lobe long subtriangular, with the terminal tubercle briefly pedunculate; ventral margin only very slightly emarginate at middle in profile. Inner sac armed with two patches of sclerotized teeth or scales and an imperfectly formed copulatory piece; left proximal teeth-patch composed of large, heavily sclerotized teeth, much larger than in *T. kosugei*, elongate, and bent at about middle, the proximal half being horizontal, while the apical half extending dorso-apically; right apical patch composed of small scales, lying at the dorsal part of apical orifice; copulatory piece imperfect, lying at the right side of the apical part of left proximal teeth-patch, largely membraneous, only a small reflexed portion of its apex and narrow dorsal edge being sclerotized. Styles short and rather narrow, arcuate, left style being longer than the right, each bearing three to six setae according to individuals.

Type-series. Holotype: ♂, allotype: ♀, paratypes: 4 ♂♂, 2 ♀♀, 24–XII–1980, Y. NISHIKAWA leg. (NSMT).

Type-locality. Otogawachi Mine, at Otogawachi of Ichijima-chô in Hyôgo Prefecture, Central Japan.

Notes. Though readily recognized on the absence of pronotal postangular seta and the peculiarly shaped elytra, this new species is doubtless closer to *T. kosugei* than to the other components of the *kosugei* complex. This affinity can be confirmed by the fact that its aedeagus is almost identical with that of *T. kosugei* in the general shape, though the inner armature is of more advanced state in this new species than in the latter. It should be noted that a copulatory piece is in the process of formation in the present trechine, a condition that is not commonly observed in Trechinae.

The type-locality of *T. silicicola* is an abandoned adit of a silicastone mine lying in

NII-Electronic Library Service

National Science Museum

the Yura-gawa drainage, about 8 km south by west of Fukuchiyama City, about 19 km northwest of Tanba Mine (westernmost known locality of *T. yoshiakii*), about 20 km west by south of Shizushi-dô Cave (type-locality of *T. ohshimai*), about 28 km southwest of Magura (that of *T. kosugei*), and about 28.5 km south by west of Oni-no-iwaya Cave (that of *T. shuten*). It is, therefore, rather widely distant from the only known locality of its closest relative.

There are several abandoned adits of the mine on the southwestern slope of Saki-yama Hill (347 m in height) at an altitude of about 280 m. The one that harbours *T. silicicola* is the northernmost and longest adit, though even this is only 40 m or so in its total length. From the entrance, which are more or less blocked with rockfalls, the adit slants down for a short way and then gradually ascends to the innermost. Trechine beetles were found mostly in the inner section of the adit, from under rock debris scattered on the wet floor.

Trechiama (s. str.) ***notoi*** S. UÉNO, sp. nov.

[Japanese name: Noto-mekura-chibigomimushi]

(Figs. 5–7)

Length: 5.65–6.65 mm (from apical margin of clypeus to apices of elytra).

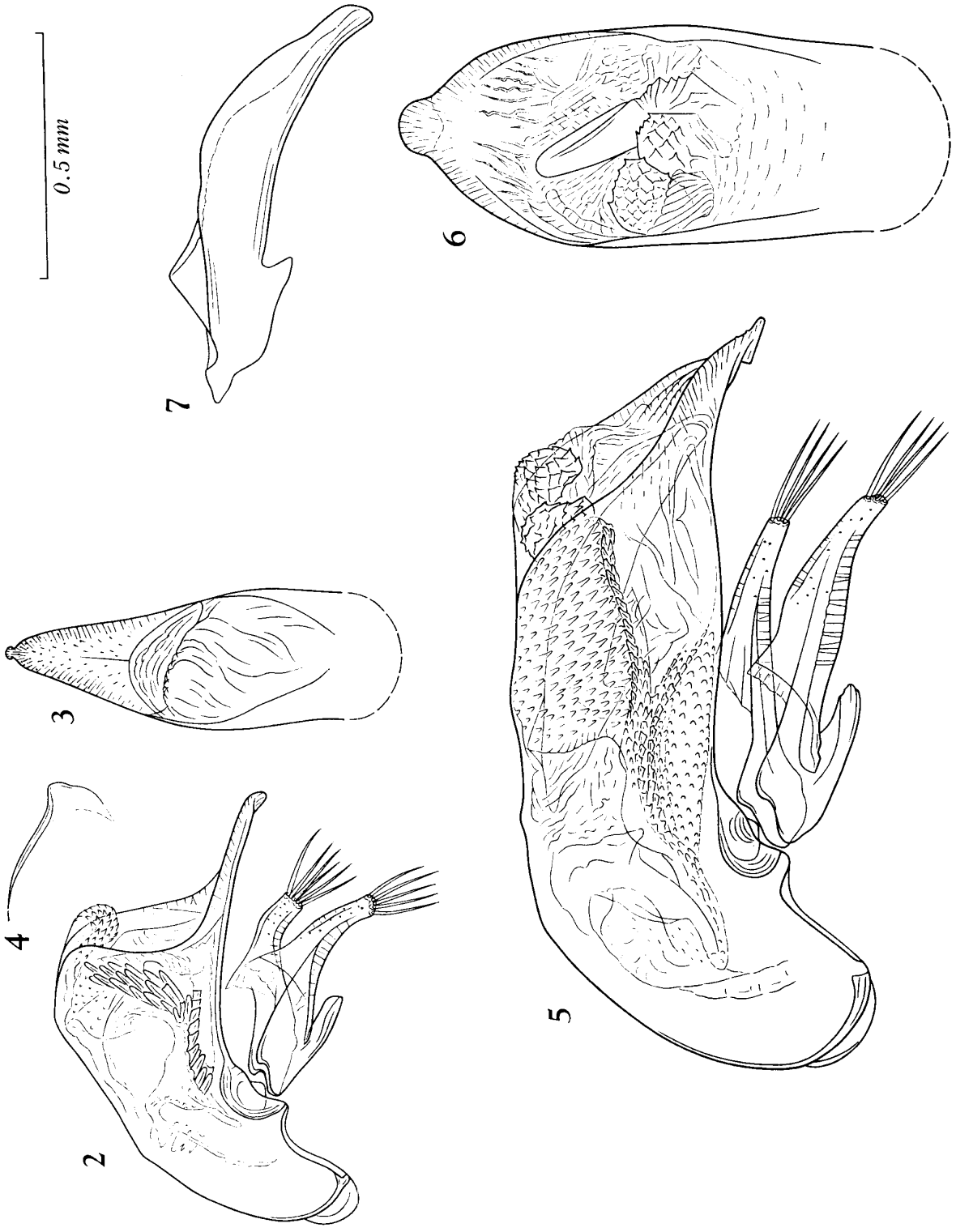
Related to *T. yoshiakii* (UÉNO, 1978, p. 298, figs. 5–8) known from several mine adits of the Taki Hills, but externally distinguished from that species by the larger hind body; the difference is especially pronounced in males, but can usually be recognized also in females. Strikingly different from *T. yoshiakii* in the size, shape and structure of male genitalia, as will be described below.

Colour as in *T. yoshiakii*. Head exactly similar to that of *T. yoshiakii*; antennae reaching apical four-ninths of elytra or extending beyond that level. Pronotum usually less contracted behind than in *T. yoshiakii*, with hind angles sharper and more protruding, widest at about two-thirds from base, and equally contracted in front and behind, though the base is more or less wider than apex due to the backward dilatation of basal part; PW/HW 1.38–1.45 (M 1.41), PW/PL 1.07–1.13 (M 1.09), PW/PA 1.40–1.45 (M 1.42), PW/PB 1.28–1.37 (M 1.34); sides less strongly arcuate than in *T. yoshiakii*, distinctly sinuate at about one-fifth from base, and then divergent towards hind angles, which are always sharp and postero-laterally produced; postangular seta present a short way before the angle; base more or less wider, though not much, than apex, PB/PA 1.03–1.13 (M 1.07), almost straight at the median part; front angles blunt and hardly advanced. Elytra ovate, much larger than fore body in ♂, not so large in ♀ though still usually larger than in *T. yoshiakii*, usually widest at about four-ninths from base; EW/PW 1.71–1.91 (M 1.81) [1.78–1.91, M 1.86, in ♂; 1.71–1.80, M 1.75, in ♀],

Figs. 2–7. Male genitalia of *Trechiama* (s. str.) spp.; left lateral view (2, 5), apical part of aedeagus, dorsal (3) and dorso-apical (6) views, and separated copulatory piece, left lateral view (4, 7). —— 2–4. *T.* (s. str.) *silicicola* S. UÉNO, sp. nov., from Otogawachi Mine in Ichijima-chô. —— 5–7. *T.* (s. str.) *notoi* S. UÉNO, sp. nov., from Toyono Mine in Nosé-chô.

NII-Electronic Library Service

National Science Museum



NII-Electronic Library Service

National Science Museum

EL/EW 1.49–1.56 (M 1.52); disc more strongly convex than in *T. yoshiakii*, especially in ♂; humeral part, striation, chaetotaxy and microsculpture as in *T. yoshiakii*. Legs as in *T. yoshiakii* though somewhat slenderer.

Male genital organ very large and heavily sclerotized, markedly differing from that of *T. yoshiakii* though similar to the latter in the fundamental structure. Aedeagus about four-ninths as long as elytra, robust, somewhat depressed, not arcuate at middle, and with very large, asymmetrical apical orifice whose left wall is reduced and widely emarginate; basal part very large, moderately curved ventrad, with fairly large basal orifice, the sides of which are more or less distinctly emarginate; sagittal aileron present though small, very narrow and hyaline; viewed laterally, apical part abruptly narrowed to short apical lobe, which is stout, curved ventrad, seemingly hooked because of ventral thickening, and rather sharp at the extremity; viewed dorsally, apical lobe very broad at the base, somewhat semicircular, and provided with a broad semicircular apical protuberance; ventral margin slightly but widely convex at middle in profile. Inner sac largely covered with scales and provided with a very large copulatory piece and two semicircular plates formed by fusion of large sclerotized teeth; most scales are poorly sclerotized, but those distributed along the longitudinal folds of sac membrane at the left side are obviously larger than the others and heavily sclerotized; two semicircular plates lie one right dorso-apical to the other at the right dorsal side of apical orifice; copulatory piece very large, elongate, more than a half as long as aedeagus, arcuate, twisted, curved to the right, rounded at apex, hooked near base on the ventral margin, and provided with a longitudinal carina on the right dorsal face. Styles narrow, more or less arcuate, left style being longer than the right, each bearing three or four setae at apex.

Type-series. Holotype: ♂, allotype: ♀, paratypes: 12 ♂♂, 8 ♀♀, 10–I–1981, Y. NISHIKAWA & A. NOTO leg. (NSMT).

Type-locality. Toyono Mine, at Hino of Yamada in Nosé-chô, Osaka Prefecture, Central Japan.

Notes. This is a peculiar new species, showing a sexual dimorphism in the size proportion of hind body to fore body. In most species of *Trechiama*, males are more or less stouter in body form than females, but numerical representation of the sexual difference cannot usually be made, if not at all impossible. In *T. notoi*, females are similar in facies to those of *T. yoshiakii*, while males can be distinguished at first sight from those of the latter because of their large hind body. The male genitalia are strikingly different between these two species, giving a positive proof on the reliability of external characteristics exhibited by males.

The type material of this interesting species was obtained in an abandoned adit of a manganese mine dug into a slate formation lying between the known localities of *T. yoshiakii* and *T. nagahinis*, about 15.6 km south-southeast of the type-locality of the former and about 16.7 km northwest of the Takayama-michi locality of the latter. The adit is located near the head of the Yamada-gawa, one of the tributaries of the Inagawa River, at an altitude of about 440 m. It is only 29 m long and practically

NII-Electronic Library Service

National Science Museum

horizontal, though having a left-hand bend about a third way from the entrance. Just beyond this bend, there is a heap of soft rock debris fed by a seepage from the right wall. It is this small talus that harboured *Trechiama*, and though the inner section of the adit seemed more favourable for the existence of anophthalmic trechines being muddy, wet and covered with rock debris, no specimens of the beetle were obtained there.

It is interesting that in profile the aedeagal apical lobe of this new species recalls that of *Ishikawatrechus* (cf. UÉNO, 1957, pp. 191–210, figs. 13–14, 21–24). The resemblance is, however, no doubt superficial. *Ishikawatrechus* is not only different from *Trechiama* in the total absence of differentiated inner armature of the aedeagus, but also in the elytral chaetotaxy, above all in the non-aggregated condition of the humeral set of marginal umbilicate pores.

References

JEANNEL, R., 1962. Les Trechini de l'Extrême-Orient. *Rev. fr. Ent.*, **29**: 171–207.

UÉNO, S.-I., 1955. Studies on the Japanese Trechinae (IV) (Coleoptera, Harpalidae). *Mem. Coll. Sci. Univ. Kyoto*, (B), **22**: 29–34.

——— 1957. Ditto (VI). *Ibid.*, **24**: 179–218, pl. 1.

——— 1959. The cave trechids from the central part of the Chûgoku District, Japan. III. The group of *Trechiama oni* S. UÉNO. *Ibid.*, **26**: 29–36.

——— 1978. Two new anophthalmic *Trechiama* (Coleoptera, Trechinae) found in non-calcareous areas of Central Japan. *Bull. Natn. Sci. Mus., Tokyo*, (A), **4**: 293–301.

——— 1980. The anophthalmic trechine beetles of the group of *Trechiama ohshimai*. *Ibid.*, **6**: 195–274.

NII-Electronic Library Service